FORESTRY

FRDA REPORT 070

ANALYSIS OF THE BRITISH COLUMBIA SHAKE AND SHINGLE INDUSTRY

by
R.M. Herring and M.R.C. Massie

FOREST RESOURCE DEVELOPMENT AGREEMENT

Canada

BC

FRDA REPORT 070

ANALYSIS OF THE BRITISH COLUMBIA SHAKE AND SHINGLE INDUSTRY

by

R.M. Herring and M.R.C. Massie

Contractor:

Stewart & Ewing Associates Ltd.
210-2560 Simpson Road
Richmond, B.C.
V6X 2P9

Departmental Representative:

Glenn H. Manning
Forestry Canada
Pacific and Yukon Region
506 West Burnside Road
Victoria, B.C.
V8Z 1M5

March 1989

This report has been reviewed by Forestry Canada and approved for distribution. Approval does not necessarily signify that the contents reflect the views and policies of Forestry Canada. Mention of trade names or commercial products does not constitute recommendation or endorsement for use.

ISSN 0835-0752

89-05026/

Canadian Cataloguing in Publication Data

Herring, R.M.
Analysis of the British Columbia shake and shingle industry

(FRDA report, ISSN 0835-0752; 070)

On cover: Forest Resource Development Agreement
Bibliography: p.
ISBN 0-662-16984-0
Fo29-19/070E

1. Shingle industlry - British Columbia. I. Massie, M.R.C. II Stewart & Ewing Associates Ltd. III. Canada. Forestry Canada. IV. Forest Resource Development Agreement. V. Title. VI. Series.

HD9769.S53C34 1989 338.4'76748 C89-092121-0

ANALYSIS OF THE B.C. SHAKE AND SHINGLE INDUSTRY

TABLE OF CONTENTS

1.0	**METHODOLOGY**	1
2.0	**STRUCTURE, LOCATION AND OWNERSHIP**	4
2.1	Structure	4
	2.1.1 Number of Firms and Mills	5
	2.1.2 Location and Plant Size	
	2.1.3 Output	7
	2.1.4 Employment	
2.2	Location	8
	2.2.1 Coast	9
	2.2.2 Interior	10
2.3	Ownership	11
3.0	**RAW MATERIAL SUPPLY**	13
3.1	TYPES	13
	3.1.1 Logs and Slabs	13
	3.1.2 Blocks	16
	3.1.3 Combination of Logs/Slabs and Blocks	18
3.2	SOURCES	18
	3.2.1 Own Timber Supply	18
	3.2.2 Contracted Timber Supply	19
	3.2.3 Purchased Timber Supply	20
4.0	**TRANSPORTATION AND MARKETING**	22
4.1	TRANSPORTATION	22
4.2	MARKETING	23
4.3	GRADING AND QUALITY CONTROL	26

REFERENCES CITED
BIBLIOGRAPHY

LIST OF APPENDICES

APPENDIX I	Shake and Shingle Mills, by Survey Area
APPENDIX II	Questionnaire
APPENDIX III	Average Ratios for Raw Material and Production
APPENDIX IV	Maps
APPENDIX V	Red Cedar Log Grading Rules
APPENDIX VI	Shake and Shingle Grading Rules - Abstracted
APPENDIX VII	Glossary of Terms

1.0 METHODOLOGY

The focus of this survey were shake and shingle producers that operated at least for some period during calendar year 1988, but production volumes cited are in terms of their 1987 output, the latest data that was available. As a result, some major mills operational in 1987 but not in 1988 are not included in either the mill summaries (Appendix I) or production volumes (Table 2.3). Such mills are identified in Part 2.1.1 of this report.

Sources used to identify producing mills for the survey were:

- The B.C. Ministry of Forests list of Major Primary Timber Processing Facilities in B.C. (Ministry of Forests, 1988)
- The Membership Directory and Buyers Guide of the Red Cedar Shingle and Handsplit Shake Bureau (Cedar Shake and Shingle Bureau, 1988)
- The client mill list of Warnock Hersey Professional Services Ltd. (Warnock Hersey, 1988)
- The client mill list of the Blue Ribbon Shake and Shingle Inspection Bureau, Inc. (Blue Ribbon, 1988)
- The membership list of the Fraser Valley Independent Shake and Shingle Producers Assocation (Fraser Valley Independent Shake and Shingle Producers Association, 1988)
- Industry directories (Madison's, 1988; Random Lengths, 1988)
- Individual responses from 25 Forest Districts of the B.C. Forest Service
- Local knowledge of the Consultant and past and present participants in the industry.

Details on mill operations were obtained in part from information coincident with acquisition of the mill lists cited, but primarily from use of a questionnaire prepared for the study (Appendix II). It was mailed out

to 66 firms identified from the mill lists, and supplemented by telephone and personal interviews. Due to the number and dispersion of industry participants, priority of the interview process was concentrated on larger producers.

Only mills **producing** shakes and/or shingles are in the summaries that follow. A few hip and ridge producers and all other remanufacturers are **not** included, since their raw material is the output of primary producers. For the same reason, brokers are not included, although some of the larger mill-owning firms are major participants in that side of the business too. In such cases, only the volume of product and employment attributable to mill operation are included in this survey. Considering the frequency at which small producers in particular drop in and out of the business and/or change name and ownership, the mill summary may have inadvertently missed some 1988 participants and included some names who did not actually produce in that year. It is the opinion of the Consultant that the net effect of such minor possible additions and deletions will be to essentially nullify each other in terms of industry-wide statistics.

In the process of assembling the mill lists and background data, there appeared to be some natural stratification of characteristics by geographic location. Accordingly, the data were compiled and analyzed under the following geographic criteria:

- Fraser Valley
- Vancouver Island
- Coast, Other (than the above)
- Interior (all else, from Terrace to the Nelson area).

In terms of these **Survey Areas**, the number of mills sampled by questionnaire and/or interviews are shown in Table 1.1.

Table 1.1

Survey Area	Total Mills	Mills Sampled	Percent Sampled
Fraser Valley	73	42	57
Vancouver Island	42	9	21
Coast, Other	12	4	33
Interior	36	6	17
TOTAL PROVINCE	163	61	38

In terms of **size of mills**, based on the number of production machines, the number of mills sampled by questionnaire and/or interviews are shown in Table 1.2.

Table 1.2

No. Machines	No. Mills	Mills Sampled	Percent Sample
1	75	8	11
2	33	14	42
3	17	8	47
4	16	10	63
5	7	6	86
6	1	1	100
7	3	3	100
8	1	1	100
10	4	4	100
12	2	2	100
13	3	3	100
16	1	1	100
TOTAL PROVINCE	163	61	38

2.0 STRUCTURE, LOCATION AND OWNERSHIP

2.1 STRUCTURE

2.1.1 Number of Firms and Mills

One hundred sixty-three (163) mills were identified in the survey. Some firms own more than one mill, as described in Part 2.3 of this report. The number of mills **by Survey Area**, in terms of those producing only shakes or shingles, or both, are described in Table 2.1.

Table 2.1

Survey Area	Number of Mills			
	Shake	Shingle	Both	Total
Fraser Valley	42	4	27	73
Vancouver Island	20	3	19	42
Coast, Other	3	3	6	12
Interior	26	2	8	36
TOTAL PROVINCE	91	12	60	163

Three large mills in the lower Fraser Valley were active in 1987 but not in 1988, and therefore are not part of the summaries of this survey. Their production is cited in part 2.1.3 as part of industry-wide 1987 production.

They were:

- Huntting-Merritt Division of Canadian Forest Products, Vancouver
- Classic Shake and Shingle Division, International Forest Products, Whonnock (formerly Whonnock Industries)
- Black Hawk Forest Products Ltd., The Clarke Group, Maple Ridge

2.1.2 Location and Plant Size

Plant size is most reliably described in terms of capacity, or number of machines, both shake and shingle. Machines either saw or split the end product from blocks delivered to them. Production volume and number of employees are subject to large and frequent variations due to wood supply and/or market trends.

Table 2.2 shows the mills identified in the survey, in terms of their number of machines and location.

Table 2.2

	Number of Mills				
Number of Machines	Fraser Valley	Vancouver Island	Coast Other	Interior Regions	Total Province
1	29	21	5	20	75
2	14	8	2	9	33
3	4	6	3	4	17
4	7	6	2	1	16
5	6	1	0	0	7
6	1	0	0	0	1
7	2	0	0	1	3
8	1	0	0	0	1
10	4	0	0	0	4
12	2	0	0	0	2
13	3	0	0	0	3
16	0	0	0	1	1
TOTAL MILLS	73	42	12	36	163

2.1.3 Output

As noted in part 1.0, the latest available data for a full year's production at the time of this survey was for calendar year 1987. Using

actual reported volumes from mills responding to the questionnaire; and extrapolating volumes for the other mills based on their machine capacity, industry average productivity per machine and assumed number of working shifts, 1987 production for those mills cited in the survey are shown in Table 2.3.

Table 2.3

Survey Area	Shakes 000 sq	%	Shingles 000 sq	%	Total 000 sq	%
Fraser Valley	1,741	65	544	54	2,285	62
Vancouver Island	453	17	237	24	690	19
Coast, Other	93	4	81	8	174	5
Interior	374	14	136	14	510	14
TOTAL PROVINCE	2,661	100	998	100	3,659	100
		73		27		100

Total 1987 volume for the industry can be estimated by addition of that year's production for the three major mills not included in this study because they were shut down at the end of 1987 as cited in Part 2.1.1 They are all in the Fraser Valley study area.

- Huntting-Merritt, add 111,000 sq. of shingles
- Classic Shake and Shingle, add 150,000 sq. for both (105,000 shakes; 45,000 shingles)
- Black Hawk, add 100,000 sq. of shakes.

A consolidated summary of 1987 industry production, including these three mills, is shown in Table 2.4.

Table 2.4

Study Area	Shakes 000 sq	%	Shingles 000 sq	%	Total 000 sq	%
Fraser Valley	1,946	68	700	61	2,646	66
Vancouver Island	453	16	237	20	690	17
Coast, Other	93	3	81	7	174	4
Interior	374	13	136	12	510	13
TOTAL PROVINCE	2,866	100	1,154	100	4,020	100
		71		29		100

2.1.4 Employment

Since employment levels are so dependent upon the number of shifts per day, which in turn are dependent upon wood supply and/or market levels, all of which are in constant state of inter-related change at some mill(s) or another, the datum used for this survey is single shift requirements as reported by questionnaire respondents and extrapolated for the other mills based upon well-established industry averages per machine shift (Appendix III). The results by survey area are shown in Table 2.5.

Table 2.5

Survey Area	Number, Direct Production Employees, Shingle Shift
Fraser Valley	852
Vancouver Island	256
Coast, Other	80
Interior	214
TOTAL	1,402

The general practice of the larger mills in particular is to run on a double shift basis when market conditions and wood supply allow. The survey's data indicates this happens a greater proportion of the year in the Fraser Valley than in the other survey areas. Since all areas are affected by the same market trends, such a fact suggests that Fraser Valley mills have more reliable access to raw material.

It can be inferred that at least 1,400 workers are employed in direct production when the industry is operating on a 3.7 million squares per annum basis. Using the oft-cited ratio of 2:1 for indirect vs. direct jobs it follows that a total of some 4,200 employees are dependent on the industry at that level from document clerks to truckers, not including block cutters and loggers.

Very few of the mills working in 1988 were unionized. The offices of IWA-Canada and Local 367 (Haney) cited only six operating mills -- all in the Fraser Valley -- certified in that year.

2.2 LOCATION

The natural range of western red cedar in British Columbia, and the location and concentration of mills cited in this survey are shown in Appendix IV.

2.2.1 Coast

The Fraser Valley is the focal point of the B.C. Shake and Shingle industry. The largest concentration of mills, including most of the larger ones, all of the major brokers, and domestic remanufacturing and treating plants are found on both sides of the Fraser River from Surrey to Dewdney - mostly clustered in the Ruskin-Mission area. This concentration has historic roots in the old-growth red cedar found in adjacent logging areas and is sustained today (in spite of gradual depletion of that local resource) by the natural transportation artery provided by the Fraser River for log booms and barges of blocks from other areas on the Coast.

Vancouver Island mills are concentrated along the East side of the Island primarily between Duncan and Campbell River, with a cluster of them around Lake Cowichan. They rely primarily on direct truck delivery of logs and blocks from adjacent logging areas and log sorting yards, as is also the case at other Coast locations.

All Coastal mills are located within the Vancouver Forest Region (#1). The North Coast District of the Prince Rupert Forest Region reported no mills within its boundaries. The distribution of mills by districts of the Vancouver Region appear in Table 2.6.

Table 2.6

Survey Area	Forest District	Number of Mills
Fraser Valley	#11 - Chilliwack	9
	#12 - Maple Ridge	64
	Total	73
Vancouver Island	#16 - Duncan	13
	#17 - Port Alberni	12
	#18 - Campbell River	15
	#19 - Port McNeill	2
	Total	42
Coast, Other	#13 - Squamish	2
	#14 - Sechelt	4
	#15 - Powell River	5
	#1B - Queen Charlotte Is.	1
	Total	12
TOTAL VANCOUVER REGION		127

2.2.2 Interior

There are two major groupings of Interior shake and shingle operations: in the Shuswap Lake area of the Kamloops Forest Region and the Arrow Lake and Kootenay Lake areas of the Nelson Forest Region. A scattering of other mills are found as far north as Valemount in the East and Terrace to the west.

There is also a substantial trade in shake blocks being shipped to Fraser Valley mills from as far as Revelstoke (500 km).

Interior mills are located in five forest regions. The distribution in terms of forest region and districts appears in Table 2.7.

Table 2.7

Forest Region	Forest District	Number of Mills
#2 Prince Rupert	#23 - Bulkley	1
	#25 - Kalum	1
	Total	2
#3 Kamloops	#31 - Clearwater	1
	#32 - Kamloops	1
	#33 - Salmon Arm	12
	#34 - Vernon	6
	#35 - Penticton	2
	Total	22
#4 Prince George	#43 - McBride	1
#5 Nelson	#54 - Revelstoke	3
	#55 - Arrow	3
	#57 - Kootenay	3
	Total	9
#6 Cariboo	#62 - Williams Lake	1
	#64 - 100 Mile House	1
	Total	2
TOTAL INTERIOR REGIONS		36

2.3 OWNERSHIP

The one common characteristic that can be attributed to operators of shake and shingle mills, regardless of size or location, is that they are strong-minded entrepreneurs of the most individualistic stripe.

As cited in Part 2.1.1, the last mills operated by large integrated public corporations (Canfor and Interfor) were shut down at the end of 1987 and declared permanently closed during the first half of 1988.

In 1988, the surviving operators in the industry were almost entirely private corporations. Some proprietorships were found amongst the smallest mills. No public corporations were found that had identifiable connections with shake or shingle mills.

Some of the larger Fraser Valley firms own as many as five other mills each, some as far away as the Kootenays. Interlocking ownerships appear to exist between even more mills but the total extent is not public information.

There is no evidence that any major integrated forest industry firm has an ownership interest in a shake or shingle mill, although some of them have raw material and custom cutting arrangements with firms in that industry.

Only one Coastal firm and no Interior ones were found to own their own logging operations. Only a few own any renewable harvest rights (quota) on Crown land, as noted in Part 3.2.1.

3.0 RAW MATERIAL SUPPLY

3.1 TYPES

Shake and shingle producers obtain their raw material in the form of:

- logs and slabs
- blocks cut from logs, slabs or stumps
- combinations of both sources.

3.1.1 Logs and Slabs

Coast

On the Coast, logs and slabs are sorted by grade before going on the market as "Shingle Sort". Slabs, which are only split-off portions of full logs, are included in the grading rules for red cedar (Appendix V). Grades K, L and M are considered the shingle grades, but border-line pieces of both better (sawlog) and poorer (pulp) grades inevitably end up in a "Shingle Sort" as well. How much of each is a constant concern of buyers and it usually leads to individual boom inspections before a sale is closed.

Interviewed producers were unanimous in the opinion that the quality of shingle logs has been on a steadily deteriorating trend in recent years, or expressed another way -- that good shingle logs were getting more scarce. To test the premise that shingle cedar (as identified by the grades K, L and M) is a declining resource, B.C. Ministry of Forests' scale records for all ownerships and tenures in the Coastal Region were examined for the period 1983-1987. The results appear in Table 3.1.

Table 3.1

Year	Red Cedar Volume as Percent of Total Coast Production	Grades K, L, M as Percent of Total Cedar Volume
1987	22	22
1986	24	24
1985	23	21
1984	25	21
1983	22	19

SOURCE: B.C. Ministry of Forests, Valuation Branch

Such results show no major changes over the five years tested in either (1) proportion of red cedar in total Coastal harvest, or (2) proportion of shingle grades therein.

A body of circumstantial evidence points to competition for the available resource, rather than a declining resource per se, as the probable explanation for the deteriorating quality of "Shingle Sorts". That competition is apparently coming from the cedar lumber and specialty product industries whose demand can create sufficient price premium to induce producers to sort as many border-line logs as possible **out** of shingle sorts. A quantified answer to the question lies only within the private transaction records of all buyers and sellers involved. One mill owner interviewed during the study noted that over the past five years, D grade logs in his shingle sorts had declined from 15% to 2% of volume and from 900 b.f. to 500 b.f. average log size. D grade is the top lumber log grade, but close enough in size requirements to shingle grade K that the choice between

the two often comes down to a grader's judgment of the quality of final cut out (Appendix V); yet, during 1988, the Coastal log market showed a price differential between the two grades ranging from $50 to $95 per m^3 from month to month (B.C. Ministry of Forests, 1988, Domestic Log Prices).

Delivery in log form is most economical where the millsite is on navigable waters and booms can be brought right alongside. The majority of mills, and all the large ones, in the Fraser Valley are in this position. The study found 68% of the mills, responsible for 75% of the production, relied on boomed logs for their raw material. On Vancouver Island a major artery for supply like the Fraser River may not exist, but the proximity to large logging operations and sorting yards does. As a result, truck delivery of shingle logs plays a larger role than in the Fraser Valley. The study found only 25% of the mills relied upon logs exclusively, but another 50% used them in part, for 71% of production.

Interior

As noted in the Section 2.2.2, cedar production is quite localized in terms of the total Interior forest industry. Harvest statistics also bear out its minor role in Regional production. Cedar accounted for only about 4% of the Interior harvest volume for the past 10 years (Ministry of Forests, 1982-1987 Annual Reports). There are no official log grades for the Interior Regions, so a historic record of grade proportions does not exist. Parties who have traditional buyer and seller relationships develop ad hoc definitions, but these can fluctuate with changes in the end-product markets.

The generally greater hauling distances and higher defect in Interior cedar logs and their combined effect on delivery costs, tend to mitigate against the widespread use of whole logs. The study found only 15% of mills relied exclusively on logs. About 30% of the mills used both, but since larger mills tended to favour logs, just over 50% of production was derived from logs.

Interior producers also noted that the volume and quality of their log supply was noticeably sensitive to trends in the cedar lumber market, but statistical evidence was not available.

3.1.2 Blocks

Blocks (or bolts) cut to the standard lengths of 18" and 24", and split to eliminate defects and reduce to hand manageable size, constitute a substantial source of raw material, particularly for smaller mills and those producing shakes. The decline in overall quality of shingle log sorts particularly affect shake producers who have to rely on the higher end of "Shingle Sorts" to get the straight-grained block lengths required. As noted above, the logs that might comprise that upper end of the shingle sorting spectrum are going increasingly into sawmill sorts.

Blocks are produced at two generalized locations, whether on the Coast or in the Interior: out in the woods and at log sorting/storage yards. In the woods they are cut from dead snags, logging residues too short to be taken out in prime logging, and from stumps left from hand falling days when the typical swell butts of old

growth red cedar caused fallers to springboard up and cut above the swell (often 3 metres or more). They are brought to roadside for palletizing and truck delivery by means ranging from the simplicity of just rolling downhill, to tight wire gravity systems, to slinging under helicopters.

In log yards, blocks are the product of remanufacturing applied to low grade logs and broken slabs, and typically stacked on pallets for truck delivery.

The low capital investment required (power saw and pickup truck, at minimum) makes block production very much the field of individual entrepreneurs. They typically sell to buyers (mills or brokers for mills) on the basis of stacked volume. The cord is still the traditional basis for pricing (128 ft^3 including wood and space between blocks). Official B.C. Forest Service scaling and records are based upon metric measurement with an adjustment factor applied to derive equivalent solid wood content: 0.8 for peeled, and 0.75 for unpeeled blocks (Appendix III).

The comparative reliance on blocks vs. logs as a raw material source, as indicated by the survey, is shown in Table 3.2.

Table 3.2

Study Area	Percent Mills Using			Percent Production	
	Logs	Blocks	Both	From Logs	From Blocks
Fraser Valley	55	33	13	75	25
Vancouver Island	25	25	50	71	29
Coast, Other	20	40	40	95	5
Interior	15	54	31	52	48
TOTAL PROVINCE	41	36	23	73	27

3.1.3 Combination of Logs/Slabs and Blocks

Technically, the only restraint on a mill's ability to use a raw material furnish of logs and/or blocks is the nature of its log infeed system; since the first step even in a logs-only mill is to reduce logs into blocks with a cut-off saw.

Except where so constrained by mill design, the survey found that the mix of types of furnish seemed to be in reaction to their relative cost and availability in the short term. None but the largest operations carried more than a month's raw material in inventory; mostly it was much less.

3.2 SOURCES

3.2.1 Own Timber Supply

Few shake and shingle mills own any timber rights (tenure) or timberland. None control all of their wood supply in such manner. Shake and shingle raw material will only comprise a small proportion of the cut from any harvesting area, but the other species and sorts derived are used to acquire more "Shingle Sort" through log trading. Having volume to trade can be as important as the cash to buy in closing many log purchase deals.

Possession of fee-simple timberland is not a significant factor in either the Coast or Interior shake and shingle industry.

Few shake and shingle producers hold renewable term licences for an annual allowable cut on Crown land (quota). B.C. Ministry of Forest records identify only one such licencee on the Coast and three in the

Interior, although in each area one firm has quota in two Timber Supply Areas (TSA's) (B.C. Ministry of Forests, 1988, Established Licencees and Apportionment within TSA).

The Small Business Forest Enterprise Program (SBFEP) of the B. C. Ministry of Forests makes non-replacable timber sales available to pre-registered bidders. The sales and bidders are categorized as Category 1 (loggers only) and Category 2 (small mill operators). It is impossible to ascertain from the registry of over 2600 applicants which Category 1 registrants may supply logs and/or blocks to the shake and shingle industry. In terms of Category 2 registrants, only ten shake and/or shingle mills on the Coast and five in the Interior could be identified from the Ministry's registry although many more were shown to have let their 2-year registration lapse (B.C. Ministry of Forests, 1988, Registry of SBFEP). In the words of registered parties who were interviewed, they found bid prices consistently too high.

3.2.2 Contracted Timber Supply

Some shake and shingle operators (both mills and brokers) have reached agreements with owners of cutting rights and log yards for priority or exclusive rights to salvage blocks from such properties. Smaller mills and block cutters have been able to make such deals on their own with timber licencees in their immediate area, usually on the basis of long time personal relationships; but the largest producers have been particularly aggressive in developing such arrangements, with major timber owners in particular. On the Coast, buyers in the Fraser Valley have established sources up the whole coast to and including the Queen Charlotte Islands providing contract block makers, as well as truck and barge transportation.

Some timber owners prefer to put out the salvage rights in their woods or yards for competitive bids on a periodic, or lot-by-lot basis. Others prefer to deal with one party on a continuing basis. The choice seems to be left to area or divisional logging managers of the licencees, since variations in practice were found between divisions of the same company.

Contractual arrangements with loggers are rare since, as noted, few shake and shingle mills control their own timber.

3.2.3 Purchased Timber Supply

Purchases of logs and blocks are the principal source of raw material for shake and shingle mills in British Columbia.

Arrangements for block purchases can vary from accepting truck loads brought to the mill yard, to setting up satellite purchasing yards near the sources of supply (these may be operated by employees or commission agents). In the case of some of the large producers in the Fraser Valley, these may be as far away as the Queen Charlotte Islands and the Interior. Being able to provide a point of sale close to the seller's location is a competitive advantage for the buyer since working capital is most block makers' scarcest asset. The buyers provide the truck and/or barge transportation onwards to their mill(s), utilizing economies of scale not available to the individual block maker. At least, one large buyer has built its own roll-on/roll-off barge dedicated to block delivery. Others have their own or contract B-train truck-trailer combinations, as well as contract barges.

The volume of blocks being shipped to Fraser Valley buyers from the rest of the Province is empirically estimated by the Consultant (no public data is available) to approximate:

	000 m3 SWE
. Coastal areas, from as far as Queen Charlotte Islands	150
. Interior areas, from as far as Revelstoke	50
. Total Province	200

The cost of hauling blocks by B-Train truck-trailer combinations at 19 cords/55 m^3 SWE (Appendix III), to Fraser Valley locations from the Southern Interior or Vancouver Island are essentially the same: around \$55/cord, or \$19/m^3 SWE.

Log purchases on the Coast are almost entirely through log brokers, although bilateral arrangements were found between individual mills and the owners of log sorting yards - particularly on Vancouver Island.

Log purchases in the Interior are primarily between the owners of shake and shingle mills and the owners of sawmills who own most of the harvesting rights. Independent loggers and private land owners can also be sources, but the high percentage of defect does not allow economic hauling for great distances. The defect factor naturally precludes hauling logs to the Coast. The blocks that are shipped represent the merchantable content of the original logs.

4.0 TRANSPORTATION AND MARKETING

4.1 TRANSPORTATION

The transportation of shakes and shingles has become totally linked with the trucking industry for most, if not all, of the shipping process. Direct loading onto rail cars is essentially extinct.

Supplying local markets can involve every size of truck, from a roofing contractor's pickup to tractor-trailer combinations -- depending upon volume and distance involved.

The U.S. West Coast, predominantly California, is mostly supplied from the Fraser Valley by trailer vans delivered over highway, or piggy-back on rail cars.

Points further East, in both the U.S. and Canada, are served in greater proportion by piggy-back trailers: "Pigs" or "TOFC" (Trailer-on-Flat-Car) in trade parlance.

Alberta customers are supplied by truck-trailer combinations, in large part from mills in Eastern B.C.

Products destined for offshore customers are loaded into shipping containers and trucked to container docks in Vancouver or Seattle, although reports were received that orders for Caribbean points have been piggy-backed to Miami, Florida for container loading.

A summary of average volumes and costs by mode of shipping are shown in Table 4.1. Volumes per load vary with both the moisture content

and thickness of the product: i.e. green vs kiln dried or 3/4" "Heavy" shakes vs 3/8" "Lights". Offshore container costs are subject to fluctuations in basic rates by shipping company and destination, as well as currency rates.

Table 4.1

Shipping Mode	Van or Container 1988 Cost Per Trip	Van or Container Capacity
Highway Vans (45')	$1,200 US to California	275 sq. KD shingles 180 sq. green shingles 220 sq. KD 1/2" shakes 175 sq. green 1/2" shakes
Piggy Back Vans (45')	$2,900 US to New York $1,500 US to San Francisco	275 sq. KD shingles 180 sq. green shingles 220 sq. KD 1/2" shakes 175 sq. green 1/2" shakes
Container (40')	$2,500 CAN to Europe $2,000 CAN to Orient	200 sq. KD shingles 190 sq. KD 1/2" shakes 120 sq. KD 3/4" shakes

The foregoing capacities and costs are **averages only**. Capacity can vary with how product is packed, and costs are subject to negotiation.

4.2 MARKETING

The only **organizations** currently committed to promoting markets for B.C. shakes and shingles are the Fraser Valley Independent Shake and Shingle Producers Association of Vancouver, B.C.; and the Cedar Shake and Shingle Bureau (formerly the Red Cedar Shingle and Handsplit Shake Bureau until November, 1988) of Bellevue, Washington, U.S.A.

In 1987, the Fraser Valley Association contracted with the Canadian government to pursue a market promotion campaign; to be funded by the industry and Federal government on a 55/45 percent basis to a $21 million maximum over five years retroactive to June 1986. The Fraser Valley Association has further contracted with the Cedar Bureau to provide promotional assistance towards that end.

Local markets are, of course, served by mills right out of their own yards. Some of these mills are actually owned by roofing contractors.

Other Canadian sales are handled by some of the mid-size and larger mills on direct basis to regional wholesalers and larger building contractors, as well as by brokers.

U.S. sales are made on a direct basis to regional wholesalers and builders by some of the mid-size and larger mills who have established customer relationships, but the largest proportion are handled through one or more of the brokerage firms located mostly in the Fraser Valley; some of which have mills of their own. All of them consolidate smaller lots of products from different producers. They may either buy the product on some net down from current market price, or sell on a commission basis for rates negotiable between 1 and 3 percent of sales price. In addition to consolidation of shipments, these brokers also provide kiln drying, fire retardent or preservative treatment and remanufacture, as appropriate for the product and customer requirements. Naturally, they have a well-developed network of sales contacts including U.S. sales agents/offices in some cases.

Some mills sell a proportion of their production directly, as well as through brokers. Some sell through more than one broker, others are exclusive to one. Whatever the relationship, it can change from time to time.

Since the relationships are so fluid (changes were found in progress) and generally regarded as very private (especially in terms of volumes involved) by the participants, a firm analysis of the role of brokers could not be quantified by this survey.

Using information obtained from various promotional sources of respective brokers and the Cedar Shake and Shingle Bureau, interviews, and the production volumes derived in the survey, an estimate can be made that five brokers in the Fraser Valley handle some or all of the production of upwards of 50 mills in all parts of the Province. These mills had a reported or estimated 1987 production of about 2 million squares of shakes and shingles.

Offshore export sales are handled by some of the same brokers as U.S. sales; plus several more who specialize in such business - acquiring volume from mills or other brokers as required.

Fire retardent and/or preservative treatment is carried out by a few mills and brokers, in their own facilities or under contract, at one of several plants in the Lower Mainland of B.C. or in northern Washington State. To be most effective, treatment should be preceded by kiln drying hence both services are usually provided by the same facility/contractor.

Payment of the U.S. tariff imposed in 1986 and revised in 1988 may be made by either seller or buyer, depending upon how the products are priced at the time of sale (tariff included or not).

4.3 GRADING AND QUALITY CONTROL

B.C. shakes and shingles are currently graded by one of three private agencies:

- Cedar Shake and Shingle Bureau, Bellevue, WA
- Blue Ribbon Shake and Shingle Inspection Bureau, Inc, Humptulips, WA
- Warnock Hersey Professional Services Ltd., Coquitlam, BC.

The Cedar Shake and Shingle Bureau has the largest representation of the three: 106 of the mills found in this survey used its services and labels. The Bureau's own records showed 125 B.C. members in January 1989, but total membership also includes firms specializing in treatment and remanufacture - which are not part of the study's mill list. In 1987, B.C. members constituted 45 percent of the number of members and produced 74 percent of reported production, proportions which have held relatively the same over recent years. It is member-owned, with its stated "objects" to include: promotion, advertising, inspection, grading, and certificating the products of red cedar shingle and shake manufacturers and processors (Cedar Bureau, 1986, By-Laws). Members pay dues according to a rate schedule based on volume and grades of production. Voting rights are proportional to the sum of dues paid (Cedar Bureau 1986, By-Laws). Grading rules are based upon Uniform Building Code (UBC) Standards 32-08 (for shakes) and 32-11 (for shingles) as promulgated by the International Conference of Building Officials (ICBO) in Whittier, CA (ICBO, 1985). In fact, both standards cite the Bureau's rules as their own.

The Blue Ribbon Shake and Shingle Inspection Bureau had nine member mills and one broker in B.C. at the time of the study. All of them were in the Fraser Valley. Its grading rules are identical to the Cedar Bureau's, linked as both are to the cited UBC Standards (ICBO, 1985). Grading services are provided to mills that pay an up-front initiation fee, and then purchase labels at varying rates per grade quite comparable to the Cedar Bureau's dues structure.

Warnock Hersey Professional Services, a subsidiary of the Lavalin Group, provides testing and certification for a wide range of products from offices and laboratories across Canada. It had 13 shake and shingle mills across the Province as clients at the time of the study. Its grading rules are those defined by the Canadian Standards Association (CSA) in Standard 0118.1 - 1980 "Western Red Cedar Shingles, Handsplit Western Red Cedar Shakes and Machine-Grooved Shakes". A 1988 update was still under review at year end. Warnock Hersey appears to be the only organization accredited by the Standards Council of Canada to certify and label wood shakes and shingles. Depending upon mill size, grading services and labels are provided to subscribing mills who pay according to their machine capacity or number of labels used irrespective of grade.

UBC and CSA Standards are essentially identical in the shingle grades, but differ in several shake grades. Abstracts of shake and shingle grades, in terms of both standards, are shown in Appendix VI.

The question of quality control was found to have a prominent but contentious profile in the industry. The survey found general agreement that it was a problem, but sharply differing opinions as to

the causative factor(s). The financial pressure faced by mills trying to maximize the recovery of saleable product(s) from a raw material supply declining in quality while increasing in cost, was one factor receiving broad-based agreement.

REFERENCES CITED

B.C. Ministry of Forests. 1988. Scaling Manual.

----------. 1988. Domestic Log Prices, monthly.

----------. 1988. Established Licencees and Apportionment within TSA.

----------. 1988. Major Primary Timber Processing Facilities in B.C., 1987.

----------. 1988. Registry of Small Business Forest Enterprize Program (SBFEP)

----------. 1982 to 1987. Annual Reports.

Blue Ribbon Shake and Shingle Inspection Bureau, Inc. 1988. List of Client Mills in British Columbia. Humptulips, WA.

Canadian Standards Association. 1988 and 1980. C.S.A. Standard 0118.1-1988 and 0118.1-1980, Western Red Cedar Shingles, Handsplit Western Red Cedar Shakes and Machine-Grooved Shakes. Rexdale, ONT.

Cedar Shake and Shingle Bureau. 1988. Membership Directory and Buyers Guide, 1988-89. Bellevue, WA. (formerly Red Cedar Shingle and Handsplit Shake Bureau, to November 1988).

---------. Grading Rules

Fraser Valley Independent Shake and Shingle Producers Association (FVISSPA). 1988. Membership List, 1988. Vancouver, B.C.

International Conference of Building Officals (ICBO). 1985. Uniform Building Code (UBC) Standard 32-8 (Shakes) and 32-11 (Shingles). Whittier, CA.

Madison's Canadian Lumber Directory. 1988. B.C. Shake and Shingles. Vancouver, B.C. p. 194-195.

Random Lengths Publications. 1988. Buyers and Sellers Guide, Eugene, OR. p. 280-288.

Warnock Hersey, 1988. List of Client Mills.

BIBLIOGRAPHY

B.C. Ministry of Forests. 1988. Scaling Manual.

----------. 1988. Domestic Log Prices, monthly.

----------. 1988. Established Licencees and Apportionment within TSA.

----------. 1988. Major Primary Timber Processing Facilities in B.C., 1987.

----------. 1988. Registry of Small Business Forest Enterprize Program (SBFEP)

----------. 1982 to 1987. Annual Reports.

Blue Ribbon Shake and Shingle Inspection Bureau, Inc. 1988. List of Client Mills in British Columbia. Humptulips, WA.

----------. 1988. Grading Rules. Humptulips, WA.

Bowra and Villiers. 1988. A Study of the Effects and Unrestricted Export of Short Cedar Boards on the British Columbia Shake and Shingle Industry. A report prepared by the Coopers and Lybrand Consulting Group, Vancouver, B.C. for External Affairs Canada.

Canada Export. 1988. External Affairs Canada, Vol. 6, No. 13, November 30, Ottawa, ONT. p. 3.

Canadian Standards Association. 1988 and 1980. C.S.A. Standard O118.1-1988 and O118.1-1980. Western Red Cedar Shingles, Handsplit Western Red Cedar Shakes and Machine-Grooved Shakes. Rexdale, ONT.

Cedar Shake and Shingle Bureau. 1988. Membership Directory and Buyers Guide, 1988-89. Bellevue, WA. (formerly Red Cedar Shingle and Handsplit Shake Bureau, to November 1988).

---------. 1988. Production of Shingles and Shakes, 1985-1987.

---------. 1988. Annual Report.

---------. 1986. By-Laws.

---------. Grading Rules

Council of Forest Industries of British Columbia. 1988. "A Partnership that Works." Vancouver, B.C.

---------. 1980-1988. Annual Reports, Vancouver, B.C.

Dobie, J. 1988. B.C. Shake and Shingle Industry, Survey of Shipments and Exports, Statistics Canada, Vancouver, B.C.

--------. 1987. B.C. Shake and Shingle Industry Statistical Problem-Diagnosis, Statistics Canada, Vancouver, B.C.

Fraser Valley Independent Shake and Shingle Producers Association (FVISSPA). 1988. Membership List, 1988. Vancouver, B.C.

--------. 1988. Posthearing Brief before the United States International Trade Commission, prepared by Arnold and Porter, Washington D.C.

International Conference of Building Officals (ICBO). 1985. Uniform Building Code (UBC) Standard 32-8 (Shakes) and 32-11 (Shingles). Whittier, CA.

McWilliams, J. 1984. "B.C.'s Newest Cottage Industry." British Columbia Lumberman. January 1984. p. 24-25, 44.

Madison's Canadian Lumber Directory. 1988. B.C. Shake and Shingles. Vancouver, B.C. p. 194-195.

Madison's Canadian Lumber Reporter. 1988. Vol. 38, Vancouver, BC. p. 1-50.

Massie, M.R.C. 1987. Utilization Opportunities for Western Red Cedar, A Review. FRDA Report 017, Nawitka Resource Consultants Ltd. for Canadian Forestry Service, Victoria, BC.

Moss, Alan and Associates Ltd. 1979. A Study of Small Shake and Shingle Mills in the Province of British Columbia. Report for Canada-British Columbia Industrial Development Subsidiary Agreement. Kelowna, B.C.

Random Lengths Publications. 1988. Buyers and Sellers Guide, Eugene, OR. p. 280-288.

----------. 1988. Weekly Report. Eugene, OR.

Statistics Canada. 1983-1988. Exports by Commodity, Cat. 65-004. Ottawa.

----------. 1986. Wood Using Industries Census of Manufactures, Cat. No. 35-250B. Ottawa.

----------. 1985. Wood Using Industries Annual, Cat. No. 35-250. Ottawa.

----------. 1984. Sawmill, Planing Mill, Shingle Mill Products Industries. Cat. No. 35-204. Ottawa

United States International Trade Commission. 1988. Western Red Cedar Shakes and Shingles, report to the President on Investigation No. TA-203-18, Under Section 203 of the Trade Act of 1974, USITC Publications No. 2131, Washington, D.C.

Warnock Hersey, 1988. List of Client Mills.

APPENDIX I Shake and Shingle Mills, by Survey Area

FRASER VALLEY - MILL LIST

COMPANY	LOCATION	NO. OF MACHINES SHG	SHK
Anbrook Industries	Pitt Meadows	1	3
Apex Roofing & Cedar Prod	Silverdale		2
Associated Cedar Products	Albion	3	3
Bill & Bill Logging	Sardis		1
Breakwater Timber Co. Ltd.	Mission		4
Breda Cedar Corp	Ruskin		2
Bynum, R.D., Shake	Agassiz		1
Cedar City Shake Ltd	Maple Ridge		1
China Cedar Products	Maple Ridge		1
Cinderella Cedar Shake	Whonnock		2
Clayton Cedar Prodcts Ltd	Pitt Meadows	3	7
C.R.E.W. Cedar Products	Maple Ridge		2
Dhaliwal Cedar Ltd.	Surrey		1
Doran, Dave	Agassiz		1
Empire Cedar Products Ltd.	Ruskin	1	2
Five Star S&S Ltd.	Abbotsford	1	3
Fraser Cedar Products	Whonnock	3	7
Fraser Pulp Chips	Surrey		1
Ft. Langley Cedar Products	Fort Langley	3	4
G & R Cedar Ltd.	Matsqui	1	4
General Cedar Products	Mission		2
Golden Shake	Langley		1
Green River Log Sales	Mission	4	8
Hargobind Shake & Shingle	Abbotsford		1
Hart & Son Industries	Whonnock	1	1
Hillcrest S&S Ltd.	Mission	4	6
J & J Shake & Shingle	Mission		1
J & L Industries Ltd.	Dewdney		1
Jaguar Shake Co. Ltd.	Abbotsford		2
Johnson, Neil	Hope		1
K & F Cedar Products	Abbotsford		1
Kostering Shakes	Chilliwack		1
L & S Cedar Products	Maple Ridge		1
Lobb, G.W., Shingle Mill Ltd.	Ruskin		4
L. Noel	Rosedale		1
Meeker Cedar Prod (1967)	Mission		13
Mission Shake Ltd.	Matsqui	2	3
Noel, Lawrence	Rosedale		1
Northside Cedar Products	Mission	1	2
Northwood Cedar Products	Mission		2
Orca Cedar Products	Maple Ridge	3	4
Parker Cedar Products Inc.	Surrey	8	2
Pattar Cedar Products	Surrey	2	3
Pioneer Shake & Shingle	Mission		1
Premium Cedar Prod. Ltd.	Mission	1	1
Prospective Cedar Products	Mission	2	3

FRASER VALLEY (cont'd)

COMPANY	LOCATION	NO. OF MACHINES SHG	SHK
Quality Shake & Shingle	Mission		2
R & D Cedar Co. Ltd.	Pitt Meadows		1
R & E Cedar Products Ltd.	Maple Ridge		1
R & K Cedar Products Ltd.	Ruskin		2
Radec Cedar Sales	Hope	1	
Rainbow Cedar Products	Maple Ridge		1
Redwood Shake & Shingle	Matsqui	1	2
Riverside Shingle Products	Maple Ridge	1	
Samra Brothers C.P. Ltd.	Delta	1	3
Scott Cedar Products	Mission	4	9
Serpentine Cedar Ltd.	Maple Ridge		2
Silver Cedar Products	Mission	1	
Silver-Coqu Cedar Products	Hope		1
Squeam Shake	Deroche		1
Starco Pacific Mgf. Co.	Maple Ridge	3	1
State Cedar	Clearbrook		2
S&W Shake and Shingle	Mission	3	2
Teal Cedar Products Ltd.	Surrey	9	4
Top Line Products	Abbotsford		2
Upstream Cedar Products	Ruskin	2	3
Vale Forest Products Ltd.	Mission		1
Valley Cedar	Abbotsford		1
Vedder River Shake & Shingle	Maple Ridge	4	4
Waldun Forest Products	Ruskin	7	5
Waleach Forest Products	Rosedale		1
Weaver Shingle Co. Ltd.	Ruskin	4	
West Coast Saws Ltd.	Maple Ridge		3

VANCOUVER ISLAND - MILL LIST

COMPANY	LOCATION	NO. OF MACHINES SHG	SHK
Aquila Shake & Shingle	Parksville		1
AR-Way Cedar Shakes	Port Alberni		1
B & D	Port Alberni		1
B.C.F. Shake Mill	Union Bay	2	1
Coal Harbour S & S Ltd	Coal Harbour	2	2
Comox Valley Shakes Ltd	Campbell River	2	2
Confederate Shake & Shingle	Lake Cowichan	3	
Contract Custom S & S	Lake Cowichan	1	1
C-J Cedar Ltd.	Merville	1	1
Dave Scott Shake & Shingle	Heriot Bay		1
E & R Enterprises	Lake Cowichan	1	1
Green and Gold Products	Victoria		1
Ham-Mac Cedar Products	Lake Cowichan	1	1
Harrison Cedar Prod	Courtenay		1
Hathaway Enterprises	Glen Lake	1	1
Hawser Shakes	Port Alberni		1
Hector Cedar Prod	Courtenay		1
J & D Shake & Cedar	Duncan	1	2
Kingcome Cedar Products	Campbell River	2	1
Krentz Forest Products	Campbell River		1
La Faehr, Albert	Black Creek		1
Lennea, R.W.	Port Alberni		1
Leomans, C.S., Cedar Prod.	Black Creek		1
Lindstrom Cedar	Lake Cowichan		1
Mazar Enterprises Ltd.	Victoria	6	1
McQuarrie, Ron	Courtenay		1
Ocean Cedar Products	Campbell River	2	3
Port Renfrew Cedar Products	Port Renfrew	1	3
Porter & Wood Cedar Co	Nanoose Bay	2	
Quadra Shake & Shingle	Quathiaski Cove	1	3
Quality Cedar Products	Honeymoon Bay		1
Rainbow Cedar Products	Nanaimo	1	
Ray's Roofing	Ladysmith		1
Ridgewood Forest Products	Lake Cowichan	2	2
Riverside Industries	Sayward	1	1
S & R Enterprises	Lake Cowichan		1
Seltic Holdings	Campbell River	1	2
Stamp River Cedar Ltd.	Port Alberni	1	1
Star Shingle	Port Alberni	3	1
T & E Shakes	Lake Cowichan		3
Tophat Cedar Prod.	Port McNeill		1
Windfall C.P. Ltd	Tofino	1	1

COAST, OTHER - MILL LIST

COMPANY	LOCATION	NO. OF MACHINES SHG	SHK
A.P.A. Cedar Products	Garibaldi H		1
Behan Cedar Products	Powell River	2	2
Bernor Shake & Shingle	Madiera Park	1	1
Cedar Haven Contracting	Powell River	1	
D & F Shingles	Halfmoon Bay	1	
Daken Forest Products	Squamish	1	1
English, Doug, Cedar Prod	Powell River	2	1
Misty Mt. Cedar Ltd	Q.C. City		1
Morton Industries Ltd	Powell River	4	
Pacific Chalet Ltd	Powell River	1	2
Peninsula Cedar	Gibsons	2	1
Tjensford, E.G.	Halfmoon Bay		1

INTERIOR - MILL LIST

COMPANY	LOCATION	NO. OF MACHINES SHG	SHK
A-1 Cedar Products	Revelstoke		1
Alpine Cedar Proudcts	Smithers		1
Armstrong Cedar Products	Armstrong		1
Begbie Shingles Ltd.	Malakwa	2	
B.C. Interior Cedarworks	Malakwa		2
Canadian Int'l Timber Corp	Sicamous	3	4
Canartic Forest Products	Valemount	2	1
Canoe Cedar Products	Canoe		1
Cascade Cedar Ltd.	Revelstoke		3
Columbia River S & S Ltd	Nakusp	8	8
Copper Mt. Cedar Products	Terrace	2	
Dans Mills	Kelowna		1
Davis Lake Cedar Ltd	Sorrento	1	2
Ed-Cori Cedar Products	Clearwater	1	1
Ferguson Cedar Products	Vernon		1
Funk, Abe	Notch Hill		1
Goat River Shake & Shingle	Creston	1	1
High Country Cedar Products	Malakwa		1
High Grade Salvage	Argenta		1
Johnson, A.H.	Enderby		2
J.O.B. Enterprise	Cambie		1
L & J Cedar Proudcts	Lumby		1
Lake Cedar Shakes	Lac La Hache		1
LeBlanc, R & J	Lumby		1
Lumby Wood Products	Lumby		1
Mable Lake Shingle	Enderby	1	2
Mike's H'split Cedar Shakes	So. Slocan		1
Mt. View Cedar Shakes	Armstrong		1
Our Cedar Products	Malakwa		2
Pebble Lake Shakes	Rutland		1
R & L Holdings	Malakwa		1
Remco Cedar Products	Meadow Creek	1	3
Revelstoke Cedar Products	Revelstoke		2
Saddle Mt. Cedar Products	Nakusp		2
Sicamous Cedar Products	Sicamous		1
Split-Rite Cedar Products	Williams Lake		1

APPENDIX II Questionnaire

INDUSTRIAL ANALYSIS OF THE
B.C. SHAKE & SHINGLE INDUSTRY
FOR CANADIAN FOREST SERVICE
CONDUCTED BY STEWART & EWING ASSOCIATES LTD. (SEAFOR)

FIRM SURVEYED: _____

Address: _____ Phone: _____

Plant: _____

Head Office: _____

Other Plants: _____

Other Businesses: _____

Person Responding: _____

Title: _____

Ownership: (Check which applies)

Incorporated _____

Subsidiary _____ of? _____

Partnership _____

Proprietorship _____

PLANT SURVEYED:

Years in Operation: _____ 1987 Gross Sales: _____

1987 Months Operated: _____

Employees:

Total Number: _____ Union (Yes/No): _____

Mgt: _____ Certification: _____

Office: _____ Bargaining Assoc. _____

Prod.: _____ (if any)

Sales: _____

Other: _____

SEAFOR

R.M. (DICK) HERRING, R.P.F.
Associate

STEWART & EWING ASSOCIATES LTD.
Forest Resource Consultants

#210 - 2560 Simpson Road
Richmond, British Columbia
Canada V6X 2P9

Res: (604) 683-7808
Bus: (604) 270-9669
Telex 04-352848 VCR
FAX (604) 270-6247

Production:

Shakes:

(thousand squares)

	1987 Actual	Capacity
24 x 1/2		
24 x 3/4		
18 x 1/2		
18 x 3/4		
Hip & Ridge		
Other		

Treatment (Yes/No) _____

if Yes, Kind? _____

Where? _____

Shingles:

(thousand squares)

	1987 Actual	Capacity
18" Perfection		
24" Royals		
16" Fivex		
Hip & Ridge		
Other		

Treatment (Yes/No) _____

if Yes, Kind? _____

Where? _____

Equipment:

No. Machines:

Resaws _____ Shingle _____

Tapersaws _____

Dry Kilns (Yes/No): _____ Dry Kilns (Yes/No): _____

Any changes in the last 5 years?

_____

_____

_____

Other Products		1987 Actual	Capacity
Cedar:	Boards for reman		
	Lumber		
	Other (e.g. fencing)		
Other Lumber			
Other wood	(e.g. firewood)		
Waste Materials	trim ends		
	chips		
	bark hog		
	sawdust		

How sold or disposed? _____

Raw Material:

From:	Logs ____%	Blocks ____%	Other ____%
Sources:			
Salvage	____%	____%	____%
Own loggers	____%	____%	____%
Contract loggers	____%	____%	____%
Purchase	____%	____%	____%
Other	____%	____%	____%
Log Purchase	____%	____%	____%
Log Trading	____%	____%	____%
Logging:			
Own	____%	____%	____%
Contract	____%	____%	____%
Crown Land	____%	____%	____%
Private Land	____%	____%	____%

Any changes over last 5 years? _____

Grades of purchase logs? _____

Delivery to mill: Method _____ Distance _____

Carrying Inventory: Where _____

Max: Vol. _____ Month _____

Max: Vol. _____ Month _____

Sales:

Markets: Canadian _____% U.S. _____% Overseas _____%

Countries_____

Shipping Method:	_____	_____	_____
Costs:	_____	_____	_____
Selling Method:	_____	_____	_____
Brokers:	_____	_____	_____
Commission Agents:	_____	_____	_____

Direct: Wholesalers _____

Retail yards _____

Builders _____

Own yards _____

Mill site _____

Pricing (F.O.B., C.I.F., Other) _____

Commissions/Discounts _____

U.S. tariff paid by _____

Quality Control:

Certification Agency _____

Labels used _____

Industry Needs/Problems:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX III Average Ratios for Raw Material and Production

AVERAGE RATIOS

RAW MATERIAL

		Sq/Mbf	Sq/m^3
Shingles/Logs	6	low grade sort	1.55 ±
	7 - 8	med grade sort	1.65 ±
	9 - 10	high grade sort	1.70 ±
Shakes/Logs	10 - 11	high grade sort	1.90 ±

	Sq/Cord
Shakes/Blocks	9 - 11
Shingles/Blocks	7 ±

m^3/Cord

1 cord = 128 ft^3 = 3.624 m^3 stacked (steres)
x 0.8 for peeled split blocks
= 2.899 m^3 Solid Wood Equivalent (SWE)

x 0.75 for unpeeled split blocks
= 2.718 m^3 Solid Wood Equivalent (SWE)

m^3/Mbf

(Shingle grade Coast red cedar)
Range: 5.0 - 5.5 - dependent upon source, and proportion slabs and logs
Average: 5.3

PRODUCTION

Productivity	Reported by Full-Time Producers Squares/Machine/8-hr Shift		Survey Results (industry avg including small producers)
Shingles	20 - 40		24
Shakes	40 - 60	with manual resaws	47
	60 - 80	with automatic resaws	

Workers/Machine	2.8	small mills (1 or 2 machines)
	3.2	medium mills (3 or 4 machines)
	3.5	large mills (over 4 machines)
	3.15	industry average this Survey

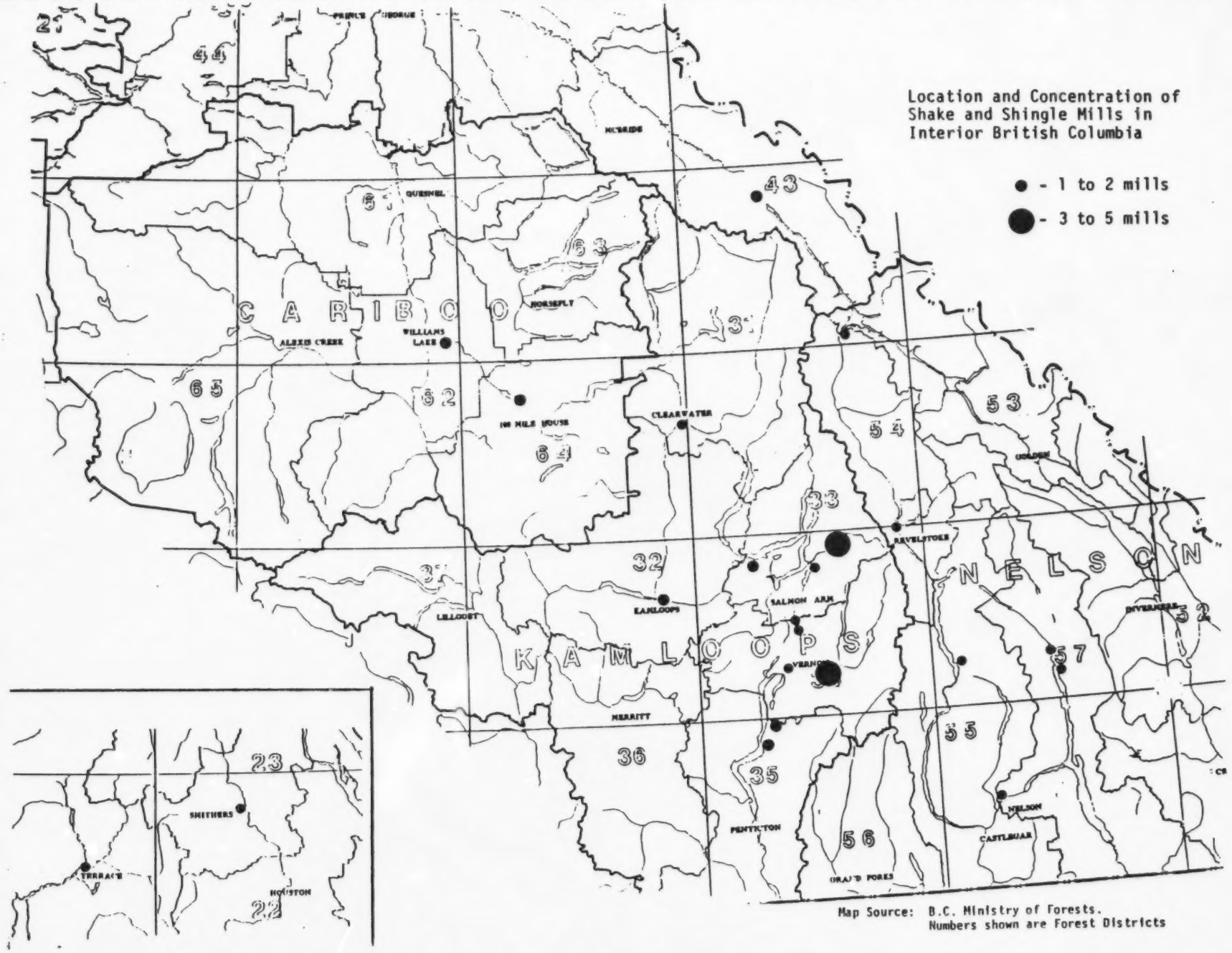
Bundles/Square

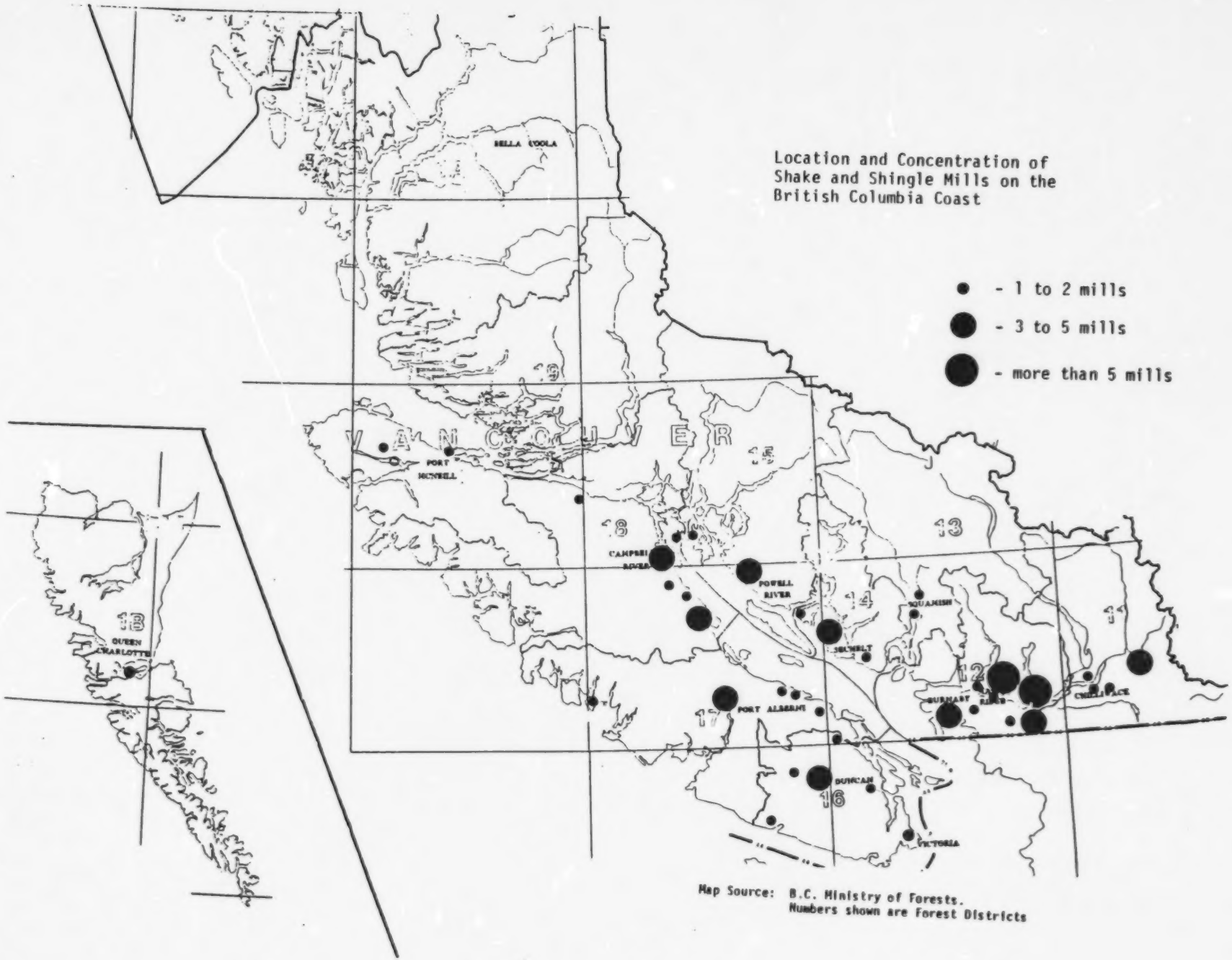
Shingles - 4
Shakes - 5

APPENDIX IV Maps

Natural range of western red cedar

from: U.S. Department of Agriculture Forest Service Bulletin FS-261, 1973.


Location and Concentration of
Shake and Shingle Mills in
Interior British Columbia
● - 1 to 2 mills
● - 3 to 5 mills
CARIBOO
KAMLOOPS
NELSON
PRINCE GEORGE
QUESNEL
WILLIAMS LAKE
ALEXIS CREEK
HORSEFLY
100 MILE HOUSE
CLEARWATER
REVELSTOKE
GOLDEN
SALMON ARM
KAMLOOPS
LILLOOET
MERRITT
VERNON
PENTICTON
NELSON
CASTLEGAR
CRAIGELLACHIE
SMITHERS
TERRACE
HOUSTON
Map Source: B.C. Ministry of Forests.
Numbers shown are Forest Districts


Location and Concentration of
Shake and Shingle Mills on the
British Columbia Coast
- 1 to 2 mills
- 3 to 5 mills
- more than 5 mills
BELLA COOLA
VANCOUVER
PORT HARDY
QUEEN CHARLOTTE
CAMPBELL RIVER
POWELL RIVER
SQUAMISH
SECHELT
PORT ALBERNI
DUNCAN
VICTORIA
13
8
14
12
17
16
Map Source: B.C. Ministry of Forests.
Numbers shown are Forest Districts

APPENDIX V Red Cedar Log Grading Rules

5.42 Cedar Grades

These grades only apply to red cedar.

5.421 No. 1 Lumber Cedar, Grade Code D

5.4211 Grade Rule

Logs 5 m or more in length and 30 cm or more in radius, or slabs 5 m or more in length, 25 cm or more in radius and 38 cm or more in thickness, where at least 75% of the gross scale will cut out merchantable or better grade of lumber and at least 50% of the lumber will be clear.

5.4212 Log Requirements to Make the Grade

(a) No powder worm damage is permitted.

(b) Logs 30 cm to 37 cm in radius must have at least 75% of the visible surface clear with knots or knot indications permitted in the upper 25% of two sides or the upper 50% of one side.

(c) Logs 38 cm or over in radius must have at least 67% of the visible surface clear with knots or knot indications permitted on the upper 33% of two sides or the upper 66% of one side.

(d) Maximum twist permitted over 30 cm of length is 8% of the radius up to a maximum deviation of 6 cm.

(e) Bark seams, burls, butt rot, catface, checks, crook, heart rot, pocket rot, oversized knots, sap rot, shatter, splits, sweep or other defect are permitted providing the portion of the log free from these defects is sufficient to meet the grade rule.

SOURCE: B. C. Ministry of Forests Scaling Manual 1988

5.422 No. 2 Lumber Cedar, Grade Code F

5.4221 Grade Rule

Logs 5 m or more in length and 25 cm or more in radius, or slabs 5 m or more in length, 25 cm or more in radius and 38 cm or more in thickness, where at least 75% of the gross scale will cut out merchantable or better grade of lumber and at least 25% of the lumber will be clear.

5.4222 Log Requirements to Make the Grade

(a) No powder worm damage is permitted.

(b) Logs 25 cm to 29 cm in radius must have the visible surface clear of knots.

(c) Logs 30 cm to 37 cm in radius must have at least 67% of the visible surface clear with knots or knot indications permitted on the upper 33% of two sides or the upper 66% of one side.

(d) Logs 38 cm or over in radius must have at least 50% of the visible surface clear with knots or knot indications permitted on the upper 50% of two sides or the upper 75% of one side.

(e) Maximum twist permitted over 30 cm of length is 8% of the radius up to a maximum deviation of 6 cm.

(f) Bark seams, burls, butt rot, catface, checks, crook, heart rot, oversized knots, pocket rot, sap rot, shatter, splits, sweep or other defects are permitted providing the portion of the log free from these defects is sufficient to meet the grade rule.

5.423 No. 2 Sawlog Cedar, Grade Code H

5.4231 Grade Rule

Logs 5 m or more in length and 19 cm or more in radius where at least 75% of the gross scale will cut out lumber and at least 65% of the lumber will be merchantable or better.

5.4232 Log Requirements to Make the Grade

(a) No powder worm damage is permitted.

(b) On logs 19 cm to 24 cm in radius there must be no more than well spaced knots up to 5 cm in diameter over 50% of the visible surface or reasonably well spaced knots up to 4 cm in diameter over all the visible surface.

(c) On logs 25 cm or over in radius there must be no more than occasional knots up to 8 cm in diameter over 50% of the visible surface, or well spaced knots up to 5 cm in diameter over 67% of the visible surface or reasonably well spaced knots up to 4 cm in diameter over all the visible surface.

(d) Maximum twist permitted over 30 cm of length is 14% of the radius up to a maximum deviation of 8 cm.

(e) Bark seams, burls, butt rot, catface, checks, heart rot, oversized knots, pocket rot, sap rot, shatter, splits, or other defects are permitted providing the portion of the log free from these defects is sufficient to meet the grade rule.

5.424 No. 3 Sawlog Cedar, Grade Code I

5.4241 Grade Rule

Logs that are

(a) 3.8 m or more in length and 19 cm or more in radius where at least 75% of the gross scale will cut out lumber and at least 50% of the lumber will be merchantable or better,

(b) 9.8 m or more in length and 19 cm or more in radius where at least 50% of the gross scale will cut out lumber and at least 65% of the lumber will be merchantable or better, or

(c) 9.8 m or more in length and 25 cm or more in radius where at least 50% of the gross scale will cut out lumber and at least 50% of the lumber will be merchantable or better.

5.4242 Log Requirements to Make the Grade

(a) By log radii, maximum knot size diameters which should not prevent the manufacture of the lumber requirements of the grade are:

Log Radius	Knot Size Diameter
19 - 24 cm	8 cm
25 - 37 cm	9 cm
38+ cm	10 cm

(b) Maximum twist permitted over 30 cm of length is 20% of the radius up to a maximum deviation of 9 cm.

(c) Ambrosia, burls, butt rot, catface, checks, crook, dryside, heart rot, insect holes, loose knots, oversized knots, pocket rot, powder worm, rotten knots, sap rot, shatter, splits, sweep or other defects are permitted providing the portion of the log free from these defects is sufficient to meet the grade rule.

5.425 No. 4 Sawlog Cedar, Grade Code J

5.4251 Grade Rule

Logs 5 m or more in length and 5 cm to 18 cm in radius where at least 75% of the gross scale will cut out lumber and at least 50% of the lumber will be merchantable or better.

5.4252 Log Requirements to Make the Grade

(a) Knots with diameters up to a maximum diameter of 6 cm should not prevent the manufacture of the lumber requirements of the grade, with the provision for oversize knots as noted in c) below.

(b) Maximum twist permitted over 30 cm of length is 20% of the radius.

(c) Ambrosia, burls, butt rot, catface, checks, crook, dry side, heart rot, insect holes, loose knots, oversized knots, pocket rot, powder worm, rotten knots, sap rot, shatter, splits, sweep or other defects are permitted providing the portion of the log free from these defects is sufficient to meet the grade rule.

5.426 No. 1 Shingle Cedar, Grade Code K

5.4261 Grade Rule

Logs 3.8 m or more in length and 25 cm or more in radius or slabs 3.8 m or more in length, 25 cm or more in radius and 38 cm or more in thickness, where at least 50% of the gross scale will cut out shingles or shakes, and at least 75% of the shingles or shakes will be clear.

5.4262 Log Requirements to Make the Grade

(a) No powder worm damage is permitted.

(b) Logs 25 cm to 29 cm in radius must have the visible surface clear of knots.

(c) Logs 30 cm to 37 cm in radius must have at least 75% of the visible surface clear with knots or knot indications no more than 2 cm in diameter permitted on the upper 25% of two sides or the upper 50% of one side.

(d) Logs 38 cm or over in radius must have at least 66% of the visible surface clear with knots or knot indications no more than 2 cm in diameter permitted on the upper 33% of two sides or the upper 66% of one side.

(e) Maximum twist permitted over 30 cm of length is 8% of the radius up to a maximum deviation of 6 cm.

(f) Bark seams, burls, butt rot, catface, checks, crook, heart rot, oversized knots, pocket rot, sap rot, shatter, splits, sweep or other defects are permitted providing that the portion of the log free from these defects is sufficient to meet the grade rule.

5.427 No. 2 Shingle Cedar, Grade Code L

5.4271 Grade Rule

Logs 3.8 m or more in length and 19 cm or more in radius or slabs 3.8 m or more in length, 19 cm or more in radius and 26 cm or more in thickness where at least 50% of the gross scale will cut out shingles or shakes and at least 50% of the shingles or shakes will be clear.

5.4272 Log Requirements to Make the Grade

(a) No powder worm damage is permitted.

(b) Logs must have at least 50% of the visible surface clear with knots permitted on the upper 50% of two sides, or on all of one side.

(c) Maximum twist permitted over 30 cm of length is 14% of the radius up to a maximum deviation of 8 cm.

(d) Bark seams, burls, butt rot, catface, checks, crook, heart rot, oversized knots, pocket rot, sap rot, shatter, splits, sweep or other defects are permitted providing the portion of the log free from these defects is sufficient to meet the grade rule.

5.428 No. 3 Shingle Cedar, Grade Code M

5.4281 Grade Rule

Logs 3.8 m or more in length and 19 cm or more in radius or slabs 3.8 m or more in length, 13 cm or more in radius and 16 cm or more in thickness where at least 50% of the gross scale will cut out shingles.

5.4282 Log Requirements to Make the Grade

(a) No powder worm damage is permitted.

(b) Knots of any size must be so spaced as to permit the cutting of shingle blocks.

(c) Maximum twist permitted over 30 cm of length is 14% of the radius up to a maximum deviation of 8 cm.

(d) Bark seams, burls, butt rot, catface, checks, crook, heart rot, pocket rot, sap rot, shatter, splits, sweep and other defects are permitted providing the portion of the log free from these defects is sufficient to meet the grade rule.

5.429 No. 5 Utility Cedar, Grade Code X

5.4291 Grade Rule

Logs 2.6 m or more in length and 5 cm or more in radius where at least 33.3% of the gross scale will cut out lumber and at least 50% of the lumber will be merchantable or better.

5.4292 Log Requirements to Make the Grade

(a) By log radii, maximum knot size diameters which should not prevent the manufacture of the lumber requirements of the grade are:

Log Radius	Knot Size Diameter
18 cm, or under	10 cm
19 - 37 cm	13 cm
38 cm, or over	15 cm

(b) Maximum twist permitted over 30 cm of length is 26% of the radius up to a maximum deviation of 13 cm.

(c) Ambrosia, burls, butt rot, catface, checks, crook, dry side, heart rot, insect holes, loose knots, oversized knots, pocket rot, powder worm, rotten knots, sap rot, shatter, splits, sweep, or other defects are permitted providing the portion of the log free from these defects is sufficient to meet the grade rule.

5.430 No. 6 Chipper Cedar, Grade Code Y

5.4301 Grade Rule

Logs that are lower in grade than utility but are better quality than firmwood rejects.

APPENDIX VI Shake and Shingle Grading Rules - Abstracted

SHINGLE GRADES

SHINGLE GRADE	LABEL	LENGTH	BUTT THICKNESS	WIDTH MAX	WIDTH MIN	LENGTH	DEFECTS PERMITTED	DEFECTS NOT PERMITTED
NO. 1	BLUE	16" Five X 18" Perfections 24" Royals	.40" .45" .50"	14" 14" 14"	3" 3" 4"	+1"-1/4" +1"-1/4" +1"-1/4" -1" up to 10% of shipment	Cross grain - max 3" within 6" of butt; Diagonal grain - max 1:6 slope from edge	Flat grain, check, sapwood, decay, knots, holes, feather tips; More than 10% of running inches/bundle less than 4" wide
NO. 2	RED	16" Five X 18" Perfections 24" Royals	.40" .45" .50"	14" 14" 14"	3" 3" 3"	10" Clear Shorts to 15" 11" Clear Shorts to 16" 16" Clear Shorts to 20"	Flat grain; sapwood over 10" from butt; feather tips, knots less than 3" diam. Small rot pockets or holes. Aggregate defects less than 1/2 width of shingle	More than 1" sapwood within 10" of butt. More than 20% of running inches/bundle less than 4" wide; bad cross grain
NO. 3	BLACK	16" Five X 18" Perfections 24" Royals	.40" .45" .50"	14" 14" 14"	2-1/2" 3" 3"	6" Clear Shorts to 14" 6" Clear Shorts to 16" 10" Clear Shorts to 18"	Flat grain, sapwood, feather tips, knots up to 3" dia. Small rot pockets or holes. Aggregate defects less than 2/3 width of shingle	More than 30% of running inches/bundle less than 4" wide; bad cross grain

ABSTRACTED FROM:

- UNIFORM BUILDING CODE STANDARD NO. 32-11, International Conference of Building Officials, Whittier, CA
- CSA STANDARD O118.1-1980, Canadian Standards Association, Rexdale, Ontario

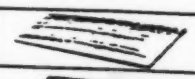
SHAKE GRADES

SHAKE TYPE	LABEL GRADE	LENGTH	BUTT	WIDTH	DEFECTS PERMITTED	DEFECTS NOT PERMITTED
TAPER-SAWN	BLUE	18"	5/8"	4" - 14" *	100% clear; flat grain up to 10% of lineal inches/bundle. Sapwood up to 1/8" on any one shorts not more than 5% of lineal inches/bundle incl. shims and feather tips. Minus 1/8" thickness tolerance when corrugations > 1/2" depth Maximum thickness: 1"	Any defects exceeding permitted limits; knots, holes, decay. Edges out of parallel > 1" * Premium Grade (CSA 0118.1-1988) allows no flat grain, sapwood, other defects
	NO. 1	24"	5/8"	4" - 14" *		
				* UBC 32-8 allows any maximum		
HANDSPLIT-AND-RESAWN	BLUE NO. 1	* 15"	1/2" medium	4" - 14" *	Same as taper-sawn except: Flat grain up to 20% of lineal inches/bundle	Any defects exceeding permitted limits; knots, holes, decay. Edges out of parallel > 1" * CSA 0118.1-1980 allows only 10% flat grain. CSA 0118.1-1988 allows 20% flat grain. * Cedar Bureau rules now allow no minus tolerance for 3/8" thickness
			3/4" heavy	4" - 14" *		
		18"	1/2" medium	4" - 14" *		
			3/4" heavy	4" - 14" *		
		24"	3/8" light	4" - 14" *		
			1/2" medium	4" - 14" *		
			3/4" heavy	4" - 14" *		
		* CSA does not allow 15"		* UBC 32-8 allows any maximum		
TAPERSPLIT	BLUE NO. 1	24"	1/2"	4" - 14" *	Same as taper-sawn except: 100% edge grain	Any defects exceeding permitted limits; knots, holes, decay. Edges out of parallel > 1"
				* UBC 32-8 allows any maximum		
STRAIGHT SPLIT	BLUE NO. 1	18" 24"		4" - 14" *	Same as taper-sawn except: 100% edge grain	Any defects exceeding permitted limits; knots, holes, decay. Edges out of parallel > 1"
				* UBC 32-8 allows any maximum		

ABSTRACTED FROM:

- UNIFORM BUILDING CODE STANDARD NO. 32-8, International Conference of Building Officals, Whittier, CA
- CSA STANDARD 0118.1-1980 and 1988, Canadian Standards Association, Rexdale, Ontario
- Private correspondence, Cedar Shake and Shingle Bureau, Bellevue, WA

CERTIGRADE RED CEDAR SHINGLES

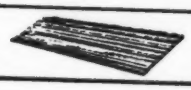
GRADE	Length	Thickness (at Butt)	No. of Courses Per Bundle	Bdls.-Cartons Per Square		Description
No. 1 BLUE LABEL	16" (Fivex) 18" (Perfections) 24" (Royals)	.40" .45" .50"	20 20 18 18 13 14	4 bdls. 4 bdls. 4 bdls.		The premium grade of shingles for roofs and sidewalls. These top-grade shingles are 100% heartwood, 100% clear and 100% edge-grain.
No. 2 RED LABEL	16" (Fivex) 18" (Perfections) 24" (Royals)	.40" .45" .50"	20 20 18 18 13 14	4 bdls. 4 bdls. 4 bdls.		A good grade for many applications. Not less than 10" clear on 16" shingles, 11" clear on 18" shingles and 16" clear on 24" shingles. Flat grain and limited sapwood are permitted in this grade.
No. 3 BLACK LABEL	16" (Fivex) 18" (Perfections) 24" (Royals)	.40" .45" .50"	20 20 18 18 13 14	4 bdls. 4 bdls. 4 bdls.		A utility grade for economy applications and secondary buildings. Not less than 6" clear on 16" and 18" shingles, 10" clear on 24" shingles.
No. 4 UNDER-COURSING	16" (Fivex) 18" (Perfections)	.40" .45"	14 14 or 20 20 14 14 or 18 18	2 bdls. 4 bdls. 2 bdls. 4 bdls.		A utility grade for undercoursing on double-coursed sidewall applications or for interior accent walls.
No. 1 or No. 2 REBUTTED-REJOINTED	16" (Fivex) 18" (Perfections) 24" (Royals)	.40" .45" .50"	33 33 28 28 13 14	1 carton 1 carton 4 bdls.		Same specifications as above for No. 1 and No. 2 grades but machine trimmed for parallel edges with butts sawn at right angles. For sidewall application where tightly fitting joints are desired. Also available with smooth sanded face.

PITCH	Maximum exposure recommended for roofs:								
	NO. 1 BLUE LABEL			NO. 2 RED LABEL			NO. 3 BLACK LABEL		
	16"	18"	24"	16"	18"	24"	16"	18"	24"
3 IN 12 TO 4 IN 12	3¾"	4½"	5½"	3½"	4"	5½"	3"	3½"	5"
4 IN 12 AND STEEPER	5"	5½"	7½"	4"	4½"	6½"	3½"	4"	5½"

LENGTH AND THICKNESS	Approximate coverage of one square (4 bundles) of shingles based on following weather exposures																						
	3½"	4"	4½"	5"	5½"	6"	6½"	7"	7½"	8"	8½"	9"	9½"	10"	10½"	11"	11½"	12"	12½"	13"	13½"	14"	14½"	15"	15½"	16"
16" x 5.2"	70	80	90	100*	110	120	130	140	150‡	160	170	180	190	200	210	220	230	240†	....	....	....	....	....	....	....	....
18" x 5.2½"	....	72½	81½	90½	100*	109	118	127	136	145½	154½	163½	172½	181½	191	200	209	218	227	236	245½	254½†	....	....	....	....
24" x 4.2"	....	....	....	....	....	80	86½	93	100*	106½	113	120	126½	133	140	146½	153‡	160	166½	173	180	186½	193	200	206½	213†

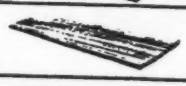
NOTES: * Maximum exposure recommended for roofs. ‡ Maximum exposure recommended for single-coursing No. 1 and No. 2 grades on sidewalls.
† Maximum exposure recommended for double-coursing No. 1 grades on sidewalls.

CERTIGROOVE GROOVED RED CEDAR SIDEWALL SHAKES

GRADE	Length	Thickness (at Butt)	No. Courses Per Carton	Cartons Per Square*		Description
No. 1 BLUE LABEL	16" 18" 24"	.40" .45" .50"	16 17 14 14 12 12	2 ctns. 2 ctns. 2 ctns.		Machine-grooved shakes are manufactured from shingles and have striated faces and parallel edges. Used exclusively double-coursed on sidewalls.

NOTE: *Also marketed in one-carton squares.

CERTI-SPLIT RED CEDAR HANDSPLIT SHAKES

GRADE	Length and Thickness	18" Pack**			Description
		Courses Per Bdl.	Bdls. Per Sq.		
No. 1 HANDSPLIT & RESAWN	15" Starter-Finish 18" x ½" Mediums 18" x ¾" Heavies 24" x ¾" 24" x ½" Mediums 24" x ¾" Heavies	9/9 9/9 9/9 9/9 9/9 9/9	5 5 5 5 5 5		These shakes have split faces and sawn backs. Cedar logs are first cut into desired lengths. Blanks or boards of proper thickness are split and then run diagonally through a bandsaw to produce two tapered shakes from each blank.
No. 1 TAPERSAWN	24" x ½" 18" x ½"	9/9 9/9	5 5		These shakes are sawn both sides.
No. 1 TAPERSPLIT	24" x ½"	9/9	5		Produced largely by hand, using a sharp-bladed steel froe and a wooden mallet. The natural shingle-like taper is achieved by reversing the block, end-for-end, with each split.
		20" Pack			
No. 1 STRAIGHT-SPLIT	18" x ½" True-Edge* 18" x ½" 24" x ½"	14 Straight 19 Straight 16 Straight	4 5 5		Produced in the same manner as tapersplit shakes except that by splitting from the same end of the block, the shakes acquire the same thickness throughout.

NOTE: * Exclusively sidewall product, with parallel edges.
** Pack used for majority of shakes.

SHAKE TYPE, LENGTH AND THICKNESS	Approximate coverage (in sq. ft.) of one square, when shakes are applied with ½" spacing, at following weather exposures, in inches (f):					
	5½	7½	8½	10	11½	16
18" x ½" Handsplit-and-Resawn Mediums (a)	55(b)	75(c)	85(d)	100		
18" x ¾" Handsplit-and-Resawn Heavies (a)	55(b)	75(c)	85(d)	100		
18" x ½" Tapersawn	55(b)	75(c)	85(d)			
24" x ½" Handsplit		75(b)			115(d)	
24" x ½" Handsplit-and-Resawn Mediums		75(b)	85	100(c)	115(d)	
24" x ¾" Handsplit-and-Resawn Heavies		75(b)	85	100(c)	115(d)	
24" x ¾" Tapersawn		75(b)	85	100(c)	115(d)	
24" x ½" Tapersplit		75(b)	85	100(c)	115(d)	
18" x ½" True-Edge Straight-Split						112(e)
18" x ½" Straight-Split	65(b)	90	100(d)			
24" x ½" Straight-Split		75(b)	85	100	115(d)	
15" Starter-Finish Course	Use supplementary with shakes applied not over 10" weather exposure.					

(a) 5 bundles will cover 100 sq. ft. roof area when used as starter-finish course at 10" weather exposure; 6 bundles will cover 100 sq. ft. wall area at 8½" exposure; 7 bundles will cover 100 sq. ft. roof area at 7½" weather exposure, see footnote (f).

(b) Maximum recommended weather exposure for 3-ply roof construction.

(c) Maximum recommended weather exposure for 2-ply roof construction.

(d) Maximum recommended weather exposure for single-coursed wall construction.

(e) Maximum recommended weather exposure for double-coursed wall construction.

(f) All coverage based on ½" spacing between shakes.

Courtesy of Red Cedar Shingle & Handsplit Shake Bureau, Bellevue, WA

APPENDIX VII Glossary of Terms

GLOSSARY

SHINGLES . A tapered slice of wood sawn from a block, the taper occurring in the direction of the grain; manufactured in random widths between 3" and 14" and three standard lengths and thicknesses, per:

Description	Length	Butt Thickness
Five X	16"	.40"
Perfections	18"	.45"
Royals	24"	.50"

. Shingles may be further processed into:

- Rebutted-Rejointed (R&R) shingles are remanufactured so that edges are exactly parallel and ends are perpendicular to the edges.

- Machine-Grooved shakes are R&R shingles with one face milled with striations, or grooves, parallel to the edges.

- Sanded shingles are R&R shingles with one face smooth sanded to remove all irregularities.

- Hip and Ridge units are shingle material recut with angled edges and nailed together to form the capping at the roof ridgeline or at corners.

SHAKES . A flat rectangular piece of wood split from a block, that may or may not be tapered in thickness, manufactured in random widths between 4" and 14", and usually in two standard lengths: 18" and 24". Butt thicknesses are generally greater than shingles of comparable length.

. Types and method of manufacture include:

- Hand-split and resawn (Resaws); handsplit shakes that have been sawn along the diagonal to produce two tapered shakes, each having a sawn back and a natural split face. The most common type. May be made in 15", 18" and 24" length.

- Taper-split; made by splitting a block in opposite directions to produce a tapered shake with split faces and both sides. Only made in 24" length.

- Straight-split; made by splitting the block in one direction producing a shake of uniform thickness along its entire length. Only made in 18" and 24" length.

SHAKES (cont'd)

- Taper-Sawn; have been sawn to produce a tapered shake with sawn faces on both sides. May be made in 15", 18" and 24" lengths (only 18" and 24" conform to Canadian Standards Association rules). They will differ from shingles of the same length by having greater butt thicknesses: .625" (5/8").

- Hip and Ridge; shake material recut with angled edges and nailed together to form the capping at the roof ridgeline or at corners.

BUNDLE . A strapped unit of shingles or shakes comprising sufficient material of the same grade and length to cover a specified area at recommended exposure for the grade involved.

SQUARE . A package of bundles sufficient to cover 100 sq. ft./9.3 m^2 of area, at the recommended exposure.

SOURCES:

- Uniform Building Code Standards No. 32-8 and 32-11
  International Conference of Building Officials

- CSA Standards O118.1 and O118.1-1988
  Canadian Standards Association